

PHYLLODY OF TIL IN RELATION TO DATE OF SOWING

PHYLLODY, also known as 'Sepaloidy', or 'Green flower' disease, is known to occur in the sesamum crop in various parts of India and Burma. Storey¹ has attributed it to the disturbed physiological conditions induced by the early sowings and heavy rainfall, while Pal² suggested that it might possibly be due to a virus. Til (*Sesamum orientale* L.), an important *kharif* season oil-seed crop in Sind, has suffered severely as a result of incidence of this disease. The area under this crop in Sind has decreased from about 42,000 acres in 1934-35 to about 6,000 acres in 1940-41.

In our breeding work, to evolve a high yielding, disease-free type of *til*, a black-seeded variety, *Jamesabad-33*, has been found to be promising. In order to test the variety and also to determine the optimum period of sowing, a factorial design experiment was conducted for two years with four sowing dates (mid-July, end-July, mid-August and end-August) and two varieties, *viz.*, *Jamesabad-33* (black-seeded) and *Cawnpore s-6* (white-seeded). During the second year (1943-44) the experiment was repeated with a slight modification, *i.e.*, another promising variety, *Karho Johi*, was added. During the first year there was a combined attack of the caterpillar (*Antigastra catalaunalis*) and phyllody. The year 1943-44 was characterised by the absence of the caterpillar but there was a severe occurrence of phyllody. This gave an opportunity of gauging the effect of various sowing dates on the occurrence of phyllody. The percentage of its occurrence was recorded in the various sowings and was statistically analysed. The results obtained would be of great interest to other workers in this direction. The data regarding the infection are presented in the following table:—

TABLE I
Percentage of Phyllody during 1943-44

Variety Sowing	Jamesabad-33	Cawnpore s-6	Karho Johi	Average of sowing	Conclusion
Mid-July (12th July '43)	11.09	22.7	13.20	15.67	Significant at P = 0.01
End-July (27th July '43)	5.66	8.04	6.44	6.71	
Mid-August (12th August '43)	0.77	0.82	0.78	0.89	Significance difference = 3.161
End-August (27th August '43)	0.93	2.89	0.60	1.47	

The yield data of the different varieties in the different sowings for two years are tabulated in Table II.

The data presented in Table I clearly indicate that there was a significantly higher attack of phyllody in all the varieties in the mid-July sowing, which continued to decrease till mid-August, after which no significant decrease

TABLE II
Yields of the Different Varieties for different Sowings

Year	Mean yield in lb. per acre				
	1942-43		1943-44		
Variety Sowing	Jamesabad 33	Cawnpore s-6	Jamesabad 33	Cawnpore s-6	Karho Johi
Mid-July	568	213	544	254	378
End July	579	363	562	412	542
Mid-August	621	326	604	464	519
End August	513	187	138	22	102

was observed. Correlating the yields of the various sowings with those of infection percentage, it is seen that there is a corresponding increase in the yield in the mid-August sowings. In the last sowing, though the occurrence of phyllody was less, yet the yield was low, due to diminished vegetative growth. Therefore early sowings appear definitely conducive to the occurrence of the disease. Another fact which is evident from the above is that certain varieties possess considerable resistance to phyllody. Thus the improved black-seeded variety, *Jamesabad-33*, is affected the least while the white-seeded variety, *Cawnpore-s-6*, is significantly more affected. In yield also the variety, *Jamesabad-33*, has given significantly higher yields than the others.

I wish to express my thanks to Dr. T. J. Mirchandani, Officer-in-charge, Agricultural Research Station, Dokri, for valuable suggestions and criticism.

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May 4, 1945.

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SOME ABNORMALITIES IN COTTON GROWN UNDER CONSTANT LEVELS IN POTS

Two strains of cotton, one *desi* (*G. arboreum* race *bengalense*), strain No. 43, and the other, American (*G. hirsutum*), M.U. 4, were grown in pots with three different constant levels of moisture mainly to study the transpiration of the plants. In the course of the periodical examination of the plants it was found that there were several abnormalities met with and some of the more important ones are recorded here. Such abnormalities were, however, not noticed in the plants of the same varieties grown as a field-crop under normal conditions. It cannot be said whether the abnormal condition of growing the plant in pots that is responsible for these aberrations. The different

moisture levels maintained in the pots had also nothing to do with most of the freaks, inasmuch as, the abnormality concerned was observed not at any particular moisture level only but at all levels.

I. BOLL ABNORMALITIES

(a) In many of the American cotton bolls an extra erect body resembling very much the gynaceum of the cotton plant with green ovary and dark nigropunctate glands were found in the centre when the bolls dehisced. In a few instances the three- or four-carpelled ovaries of this appendage exhibited minute fuzzy ovules inside them (Fig. a).

(b) The cotton fibre usually develops on the cotton seed; but a few lint hairs were found to develop both in the American and *desi* varieties from the carpel wall, suture and the ridges of the locules. Again, in American, a tuft of fibres was given out by the apex of the extra gynaceous body as well as the apex of the carpel (Figs. a, b and c).



(c) In a few Asiatic plants, bolls having three-carpels and in addition a partially developed carpel were recorded.

II. LEAF AND FLOWER ABNORMALITIES

Besides the above abnormality, there were found certain abnormalities with regard to leaf and flowers which are mentioned below:—

(a) In the *Desi* cotton grown under higher levels of moisture three leaves having double lamina (mirror image) with a twin petiole joint right through, developed. Another plant under low moisture, put forth two consecutive leaves, the lower leaf having only the right half of the lamina of a normal leaf while the upper developed the left half. The petioles of these leaves were reduced in thickness.

(b) A plant grown under low level of moisture produced a flower with two bracts while two plants grown under the highest level of moisture produced flowers having four to seven lanceolate bracts. In a plant grown under optimum condition, a double and a triple flower of different ages were produced on a single pedicel with three common bracts in addition to their own.

The abnormalities of leaves and flowers are not very important but the presence of lint on the carpel walls and lock sutures is very unusual and has not been recorded before. The material grown was from selfed seed of a single plant. While the cause for the boll abnormality is not known, the material has been carefully gathered and will be grown again both in pots and under ordinary conditions to see if the same will be repeated.

The work was carried out in the Cotton Genetics Research Scheme, Indore, financed by the Indian Central Cotton Committee.

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May 8, 1945.

LONG SMUT OF SORGHUM-METHOD OF INFECTION

LONG-SMUT of Sorghum caused by *Tolyporium Ehrenbergii* (Kuhn) Pat., has been recorded from India and Africa. In India, it is known to occur in Baluchistan, Sind and Madras. It has been regarded to be not a very destructive disease as the smut attacks only a few grains in an earhead. But in recent years, a survey of the disease was undertaken in Sind, and it was found in the year 1943, that the smut was present practically in every earhead and the number of grains attacked varied from 1 to 30. In India, its presence has been recorded by Butler (1918) and Kulkarni (1918). Kamat (1933) has studied the cultural characters of the fungus and also the effect of temperature on the growth of the fungus in culture. So far no worker has attempted to establish the method of infection of this smut. Butler has suggested that the infection may be a localised one. To determine exactly how this disease appears, this investigation was undertaken.

Effort was made to produce the disease in a number of ways, (i) spores of the smut were mixed with seed before sowing, (ii) spores were mixed with soil, (iii) Moore's vacuum method of infection, (iv) spores were dusted on the flowers, (v) spores were germinated on potato-dextrose agar and sporidia were obtained in culture. A suspension of sporidia was made in water and a few drops of this suspension were placed in the buds with the help of a pipette.

It was observed that no infection appeared in the case of first four methods. Infection in the case of last method was very successful and ninety per cent. of the infected earheads bore smuted grains. It is quite clear from the above experiment that chlamydospores by themselves do not play any role in the production of the disease. It is the sporidia which take an active part. It is likely that the chlamydospores from the previous crop lie in the soil and the development of favourable conditions, germinate and produce sporidia. These sporidia in turn are carried by means of air to the earheads and produce the disease. Study is being made to confirm the above assumption and also of the factors which induce prolific production of sporidia.

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May 23, 1945.

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